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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/747,304	12/20/2000	Shiva Prakash	061450 0270200	2645

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PILLSBURY WINTHROP LLP  
2475 HANOVER STREET  
PALO ALTO, CA 94304-1114

EXAMINER

DAVIS, OCTAVIA L

ART UNIT	PAPER NUMBER
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2855

DATE MAILED: 01/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/747,304

Applicant(s)

PRAKASH ET AL.

Examiner

Octavia Davis

Art Unit

2855

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 11/18/03.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-85 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-85 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:]

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 – 3, 5 – 7, 9 – 31, 42, 44 – 54, 56 – 59, 62 – 66 and 68 – 81 are rejected under 35 U.S.C. 102(b) as being anticipated by Inomata et al.

Regarding claims 1, 7, 9 – 15, 17, 18, 31, 42, 44 - 53, 59, 62 - 65 and 78 – 81, Inomata et al disclose magnetic elements utilizing spin-dependent tunneling effects comprising a sensing device including a substrate 31 composed of a nonmagnetic material such as glass, Sic or the like, the sensor including a plurality of layers, the layers comprising a current biased magnetostrictive sensor including a non-magnetic conducting layer (See Col. 16, lines 16 –17) disposed between a free ferromagnetic layer 39 and a pinned ferromagnetic layer 33, means 1 for sensing a resistance in the layers upon application of pressure while an externally supplied current is being applied (See Cols. 15 and 16, lines 55 – 67 and 1 – 46), the applied pressure causing the magnetization vectors to change from the biased state through the property of a non-zero magnetostriction and thereby result in a change in resistance to a tunneling current produced by the applied voltage that flows in a direction orthogonal to a plane of the layers.

Regarding claims 2, 3, 16 and 66, the magnetization vectors are parallel in an initial state (See Cols. 12 and 16, lines 31 – 46 and 34 – 36).

Regarding claims 5, 6 and 56 - 58, a reference resistance of the device is sensed when the ferromagnetic layers 33, 39 are in the biased state without the application of pressure (See Col. 12, lines 44 – 45).

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Regarding claims 19 and 68, the ferromagnetic layers 33, 39 are composed of NiFe or CoFe alone or in combination (See Col. 16, lines 4 and 13).

Regarding claims 20, 21, 54, 69 and 70, the thickness of a non-magnetic insulating layer 35 is within the range of 0.1 to 10nm (See Col. 15, lines 62 – 65).

Regarding claims 22 – 26 and 71 - 73, the sensor includes a buffer or capping layer 30, Ta, disposed below layer 33 (See Col. 13, lines 58 – 64).

Regarding claims 27 – 30 and 74 - 77, an interlayer 38 is disposed between at least one of the ferromagnetic layers and the nonconducting layer (See Fig. 7).

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4, 8, 32 – 41, 43, 55, 60, 61, 67 and 82 – 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inomata et al in view of Gurney et al.

Regarding claims 4, 8, 32 – 37, 55, 60, 61 and 67, Inomata et al lack the sensing device including a plurality of sensors that are formed in a two dimensional array and operate as the one sensor so that each sensor detects the pressure of an area associated with that sensor. However, in Gurney et al (8377) it was commonly known to those of ordinary skill in the art that additional sensor elements could be employed (See Col. 6, lines 30 - 37).

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Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize additional sensor elements to provide an optimal sensor response circuit (See Gurney et al, Col. 6, lines 35 - 37).

Regarding claims 38 - 41, 43 and 82 - 85, Inomata et al lack a protective coating layer disposed above the upper ferromagnetic layer. However, in Gurney et al, a protecting coating layer 81 is disposed above the upper ferromagnetic layer 70 (See Col. 6, lines 1 - 4).

Therefore, it would have been obvious at the time the invention was made to modify Inomata et al according to the teachings of Gurney et al for the purpose of, exchange coupling with a pinned layer and a ferromagnetic layer (See Col. 6, lines 1 - 4).

### ***Response to Arguments***

5, Applicant's arguments with respect to these claims have been considered but are moot in view of the new grounds of rejection.

6. Any inquiry concerning this communication should be directed to Examiner Octavia Davis at telephone number (703) 306 - 5896. The examiner can normally be reached on Monday - Thursdays (9:00 - 5:00), Fridays off.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz, can be reached on (703) 305 - 4816. The fax phone number for the organization where this application or proceeding is assigned is (703) 746 - 4409.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 - 0956.

ED

OD/2855

1/20/04

  
EDWARD LEFKOWITZ  
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